

Edusemiotics as Process Semiotics: towards a new model of semiosis for teaching and learning

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Abstract

Standard definitions posit the sign as a discrete entity, in relation with other signs and standing for an object (either physical or psychological). Thus the sign has two roles, as prompt and as substitutive representation. The latter raises difficult questions about the relationship of the semiotic to the non-semiotic or pre-semiotic which can be resolved logically (as in Peirce) or rejected as unanswerable (as in Saussure) but which can never be satisfactorily resolved empirically as the phenomenal cannot be divorced from the semiotic. This impasse can be resolved if we drop the assumption that the sign is essentially substitutive. The assumption of discrete entities, at either the phenomenal or the noumenal levels, is a function of discredited substance metaphysics. On a process metaphysical account, the reality of the sign is not attached to the discreteness of any pre-existing entity. The sign remains as prompt and as relational but not (other than sometimes with respect to other signs) substitutive. Rather than defined as standing for an object, the sign can now be regarded much more simply as a feature of an event. This conception of the sign is explored in terms of its implications for teaching and learning.

1. Introduction and rationale: the case for re-examining the fundamental nature of the sign

The use and value of semiotics are in large part dependent on construals of the sign. Where semiotic approaches are grounded in an unqualified Cartesian mind-body dualism, semiotic activity tends to be construed as the activity of the human mind using symbolic systems as a gloss or commentary on an external reality that is not itself dependent on semiosis. This purely anthropocentric, implicitly dualist semiotics provides rich resources for the study of, for example, literary texts and the visual arts; indeed, the neat separation of the semiotic from the pre-semiotic may aid rather than abet semiotic analysis in such fields by failing to problematise widely held assumptions about the relationship of the arts to external reality. On this account, a sign (after Peirce as icon, index or symbol) stands in substitution of an object, whether physical or psychological. Semiotics thus construed is a purely applied discipline; the nature of the sign does not unsettle understanding of that which the sign represents. In some ways, this opens up possibilities for semiotics that, I shall argue, a more radical position excludes: for example, it might be possible to undertake a semiotic analysis of a science documentary without questioning the science that is presented. To many, perhaps most, non-semioticians, this might be highly desirable. At the same time, such an approach limits the potential scope of semiotics, particular in fields beyond the arts: in the social sciences or education, for example, where the role of interpretation may be downplayed in the construction of knowledge and reality (Stables, 2013), and even in fields such as physics, where

universal laws are brought into question, as in pansemiotic accounts of the later thought of Peirce.

At least by 1907, Peirce would recognise that the end of semiosis of the highest kind is an intellectual habit, which realization may lead us to wonder whether the third basic element that is active in the universe, habit-taking, is a form of semiosis, and if that is what imparts the teleological current that Peirce finds in evolution. (Houser, in Peirce, 2000: lxxxiii-iv)

Investigation of the nature of the semiotic therefore tends to raise more troubling concerns. In particular, forms of semiotics beyond the narrow anthroposemiotics described above pose fundamental questions about the extent to which the sign can validly be seen as standing for something else. Even in the burgeoning field of biosemiotics, where definitions of the latter abound, definitions of the sign remain tacit. (Brier, undated.ⁱ) A biosemiotic view of DNA as code, for example, implicates the semiotic and the presemiotic much more closely than is necessary in semiotic analysis of, for example, a film about the Second World War, where representation can be discussed on a quite different level from historical fact. Indeed, it is hard to describe what DNA represents; it simply is. In terms of the sign having two major roles, as prompt and as substitute, DNA clearly fulfils the former but not the latter. Biosemiotics *per se* calls into question the role of sign as substitutive representation at the same time as it calls into question anthropocentric conceptions of consciousness through its construals of *umwelt* and *innenwelt* (Uexküll, 1982).

On other than a purely applied level, therefore, the role of sign as substitutive representation (as opposed to merely re-presentation, which is less problematic) is deeply problematic, and attempts to explain it run into difficulties accounting validly for the nature of the non-semiotic or pre-semiotic on which it supervenes. The most common resource to draw on here is Peirce's triadism, whereby semiosis acts at the level of Thirdness, dependent on Firstness and Secondness. While this seems unproblematic as syllogistic generalisation (If Firstness plus Secondness infer Thirdness, then Thirdness implies Firstness plus Secondness), it becomes deeply problematic to explain in terms of concrete exemplification as what we know, we know at the level of Thirdness.ⁱⁱ A gap thus arises between logical schema and the capacity of semiotics to function analytically or critically. Koopman makes this objection to Peirce from the perspective of his transitionalist pragmatism, arguing that pragmatism is most powerfully manifested as engaged cultural critique, whereas Peirce shies from such critique (Koopman, 2009: 41-44) while never fully abandoning the myth of the given in his dependence on Firstness and quality (: 78-100)ⁱⁱⁱ. Given the shared commitments of pragmatism and semiotics to meaning as meaning-in-use, Koopman's point is relevant to the present argument. However, Koopman considers only briefly the value of semiotics as a particular form of pragmatism that has the potential to escape entirely the mind-body/language-experience dualism that neopragmatists such as Sellars, Davidson, Brandom and Rorty (whom Koopman admires) can resolve only partially by rejecting the givenness of brute experience in classical empiricism^{iv}. Semiotics can offer a rich, or thick empiricism which construes linguistic experience as no more or less real than sensory experience and thus avoids the perennial philosophical problem of having to justify valorizing one of

these over the other, as Koopman briefly suggests.^v However, leading semiotic theorists, including Deely (1990) and Eco (1984), by retaining the category of presemiotic activity, have sidestepped rather than overcome this dichotomy. In this they follow Peirce who, although widely regarded as moving towards a pansemiotic position, in which semiotics accounts for much more than the progress of human reasoning, seems not to have abandoned his commitment to Firstness, Secondness and Thirdness with its concomitant commitment to presemiotic activity. The triadic model thus offers logically more than it can deliver in terms of empirical verification. The strong realism to which it aspires is dependent on the classical empiricist myth of the given.

A common ground for the Peircean approach is to stress the desirability of a triadic over a dyadic conception of the sign (as in Saussure, 1974), as triadism somehow links ongoing sense making to, at the very least, previous sense making. The dyadic model, meanwhile, tends to be prone to an absolute form of thoroughgoing relativism in which the relationship of sign to not-sign (or even other sign) can only be dismissed as arbitrary. Such a position is, however (and ironically) more empirically verifiable than Peircean triadism: it is self-evident both that signifiers really exist and that they evoke a range of responses (i.e. that there is also evidence for the signified). However, it is self-limiting in its scope. While Peirce may stand accused of impersonalising semiosis, Saussure might be accused of over-psychologising it by denying any framework for linking the purely anthroposemiotic to anything beyond it. Indeed, it might be argued that such a position goes beyond relativism altogether by undermining the criteria for relative judgment; that is, it offers no stronger grounds for explaining how semiosis proceeds than very thin conceptions such as Derrida's *trace* (Derrida, 1978). In the case of Derridean

deconstruction, this goes beyond a simple (and easily justifiable) rejection of correspondence theories of truth by also rejecting coherentism. While an acceptance of meaning as always deferred is a useful corrective against mechanistic and atomistic approaches to, for example, learning theory, it runs the danger of encouraging the view that meaning-making and action are totally arbitrary and of no relevance to the extra-human (indeed, perhaps of no clear relevance at all), and thus not valid even as partial expressions of the universal. Logically, therefore, human action, *inter alia*, might be entirely unpredictable and without consequences for the non-human, whereas it is, as observed and experienced, partly predictable and can have significant consequences for the non-human which, in turn, return to have consequences for the human (Derrida, 1976, 1978; Stables, 2005: 67-71)

These problems of accounting for the presemiotic can be attributed to the legacy of substance metaphysics: that is, to the tradition, grounded in Aristotle's conception of the unmoved mover, that the universe fundamentally comprises entities that interact^{vi}. (Note that that modern physics' continued employment of the concept 'particle' bears witness to this, even though a sub-atomic particle may be better understood as a burst of energy rather than a discrete material object.) On this account, presemiotic activity, at the body/(thin) experience level, both informs semiosis and grounds it in external reality, while the only feasible alternatives to this tend towards social constructionism, construing that external reality as figment of human semiosis. Both responses fail to integrate the subjective fully with the objective and pre-subjective and thus each diminishes the value of the subjective. Thus for both the strong Peircean and the structuralist, the sign is given a life irrespective of the sign user who is cast in the secondary role of commentator on

that which semiosis presents, which either does or does not give insight into external, physical reality. The alternative to this is a process account, within which I shall argue the sign can play a more central role that does not require attempts to justify substitutive representation.

2. Substance vs. process: metaphysical contexts for defining the sign

Substance metaphysics assumes the basic constituents of the universe to be discrete, and usually material entities.^{vii} Atomic theory, for example, is grounded in the assumption that the smallest entity is that of the constitutive atom; sub-atomic physics still adheres to substantive language in terming the constituents of the atom (a contradiction in terms to the Greek atomists) “particles”. Even Cartesian dualism is grounded in substance metaphysics, with Descartes arguing that mind and body were two different kinds of substance, one subject to extension and the other not. (Thus Cartesian mind body dualism is substantive and not merely schematic.) Traditionally, substances move in space, which is empty, and interact. Aristotle postulated, on this basis, that the role of physics was to understand the movement and interaction of substances and that behind all known substances must be an unmoved mover that imparts movement to all other substances (Bodnar, 2012). Despite its adherence in terms of some of the language of modern science, contemporary physicists have long abandoned the idea either that the universe began with inert mass or with entities on an other-than-physical level, or that space is empty. In relation to the latter, in very recent times, physicists have speculated that over 90% of the universe may be dark matter or energy (note the substantive term employed here) of which we have no current understanding (NASA, 2014). Thus physics has

abandoned the basis of substance metaphysics largely though its language still resonates in terms such as “particles” and “matter”, certainly where these are taken as fundamentally constitutive rather than as effects.

On a process account, the cause-effect dynamic is reversed: substance is seen as the result of process and not *vice-versa*.

While process philosophers insist that all within and about reality is continuously going on and coming about, they do not deny that there are temporally stable and reliably recurrent aspects of reality. But they take such aspects of persistence to be the regular behavior of dynamic organizations that arise due to the continuously ongoing interaction of processes. In order to articulate a process view of reality, a special theoretical effort is required, however, since the standard theoretical tools of Western metaphysics are geared to the static view of reality (Seibt, 2012).

Here, the basic elements of the universe can be understood as energy or forces, but not as the discrete entities that are created by them, thus a realist ontology can be maintained but without belief in discrete noumenal entities. On an everyday level, this minimal ontological realism makes it much easier to accommodate relative hardness and softness, for example, or the boundaries between states of matter (solid, liquid, gas). Crucially to the present argument, there is no reason to regard the phenomenal sign as representative substitute for a noumenal object, nor as a discrete entity in its own right. (Note that although Kantian language is employed here, Kant had no grounds for assuming discrete objects to exist at the noumenal level: see Stables, 2014.) Nor is it necessary to see the sign as employed in relation to other signs by virtue of their qualities, dispositions or saliences (e.g. Pikkarainen, 2013) in order to understand the sign as

relational. At the same time, the sign is simultaneously real and subjective (I engage semiotically therefore I am). The sign can simply be regarded as a feature of an event, and personal experience as implication in an event, where a sequence of events defines a process, and “process” in the abstract indicates the sum of all processes, and thus of all events. As such the sign is inherently relational, as is a word in a sentence or a stem cell in a brain, heart or limb. It might be argued that for “feature” should be read “identifiable feature”, but this would be to fall back into the myth of the pre-semiotic given. “Identifiable” is implicit here, as an unidentified feature, although a logical possibility, is always empirically unverifiable.

The argument from process to sign is therefore as follows:

- (1) Process comprises processes;
- (2) Processes comprise events;
- (3) Events are known through experience;
- (4) Events are constituted by signs;
- (5) A sign is therefore a feature of an event.

While (1), (2), (4) and (5) are unambiguous, the model rests on a particular understanding of (3) in two respects:

(3i). In stating that events are known through experience, there is no implication that events exist separate from experience, and that human beings sometimes observe, sit in on, or make peripheral contributions to them. Such an explanation is necessary if and only if (3ii) ‘experience’ is construed either as brute sensory experience, as in (thin) empiricism, or as product of the human mind, as in anthroposemiotic idealism: i.e. as

language or some other form of symbolic representation. The present argument rests on accepting an event as a set of experiences, which by no means implies that my or our human experience is all there is to an event; however, as my experience is my implication in events, and as both the experiences and the events overlap and intersect with others, so my worldview is an insight into the real world, however strange it may seem to others. This insight is both valid and limited, as all knowledge is both constrained and made possible by context.

Note that on this account the sign retains its function as prompt but loses it as substitute.

This is a truly anti-Cartesian position insofar as it fails both to acknowledge a qualitative difference between that which is experienced (though not that which is experienced by a mere individual or group of persons) and between thinking human mind, motivated by reasons, and unthinking mechanical nature, motivated by causes. On the other hand, it retains a key element of Cartesian thinking which is lost in most modernist accounts: the centrality of the subjective. It is also truly anti-Aristotelian in denying the possibility of regression to a primary substance as cause: that is, whether there was anything before process or before an event in which something was implicated is an unanswerable question as process cannot be unthought. Our knowledge of an event remains incomplete insofar as the total universe comprises many events with many entities implicated in them, but this does not place an artificial division between event as experienced by “me” or “us” and the “real event”. Our experience is (no more or less than) our implication in events, and the fact that we attribute labels such as “consciousness” and “memory” to such experience does not constitute valid grounds for

objections such as that the present account only acknowledges the possibility of events witnessed by the human mind. To argue on the basis of this objection would be to create a straw man from the human descriptions of experiences of events that human beings have had. We do not know how it is to be implicated in events other than in the ways in which we have been implicated, but this does not preclude other sorts of implication.^{viii} Furthermore, the experiences of those implicated in any particular event overlaps but does not coincide. (See Stables 2012 for further discussion of “overlapping phenomenal worlds”.)

It is this sense of overlapping that drives the educational considerations that comprise the remainder of this paper.

An event is that which is experienced, but it is experienced somewhat differently by each experiencing being. There is therefore no totality of an event nor of a process, nor of process itself other than the combined experience of experiencing agents which can never be the experience of one experiencing agent. The experiencing agent therefore construes the processes and therefore process. (The scientist understands cosmology, for example, as part of the community of scientists.)

The subjective, which is somewhat intersubjective, therefore trumps the objective. It is in the overlapping of subjectivities that help can be given, progress can be made, and love can be experienced.

3. Implications for teaching and learning

As will be clear from the argument so far, understanding teaching and learning in semiotic terms is not simply a matter of applying a form of semiotics to education. How

the sign is conceptualised is significant. If the sign is substitutive relation, then there is a relatively greater tendency to see teaching as a process of conveying objective truth. There is a relatively greater tendency to see understanding in either-or terms, as right or wrong, and the teacher-student relationship as one of expert-ignoramus, rather than as relatively more and less explorers on the revised model presented here.

Let us consider in more detail the process of learning. Traditional theories of learning, grounded in cognitivism and behaviourism, are not required on the present perspective, as they rest on strong mind-body dualism. It is not a case of whether we learn by responding to stimuli or by changing our thought patterns. Depending on how these are construed, we learn by both of them. Indeed, it can be argued that we learn all the time, inevitably, on the grounds that all living is semiotic engagement (Stables, 2006) and semiotic engagement produces inevitable change. On this view, “learning” becomes a value judgement on desirable change rather than a qualitatively distinct form of life.

Learning therefore is responding differently and/or making new meaning (which itself is a kind of response). It can be explained very simply as arising when habitual or conditioned responses (cd) encounter new contexts (cn) which result in unexpected outcomes (O) and therefore revision of habits:

$$O = (cd+cn)$$

On this model, cd and cn are bracketed because habitual response always happens in context.

This can be expanded to account for social and environmental change and progress (C/P) as:

$$C/P = (cd+cn)^n$$

Consider the particular example of a student encountering a word in a new context presented by the teacher. Say, the student knows the word ‘nuclear’ but has not been formerly introduced to the term “nuclear family”. In this case:

$$O = (cd [= \text{nuclear cf. bomb/power}] + cn [= \text{nuclear [cf. small family]})$$

In other words, the student’s preconception of the meaning of “nuclear” will have been altered by the new encounter. This may or may not lead to conscious reflection on what “nuclear” really means, but it will prepare the student to encounter both meanings in the future. At first, however, the student may tend to have negative connotations of a “nuclear” family by virtue of simple association.

Subconsciously, when we encounter a word in a new context, we test whether our existing conceptions apply. Thus the denotations and connotations I have of the word “nuclear” do not necessarily change perceptively every time I hear the word. Rather, there are occasions on which the context renders it meaningless to carry on with my habitual responses to the term. As a learner, however, I will always try to make sense of the item in terms of my habitual responses. I may do this by making a judicious selection from them. Thus the model can be explained more fully as:

$O = (cd+cn)$ where new interpretation (O) relies on sum of, or selection from, previous evocations (cd) in terms of what works in the present context (cn).

In some situations the newly encountered item may be completely unrecognizable: a new sign entirely. In this case, we may seek from our previous experiences the best analog we can. That is to say: understanding of new item (O) relies on strongest resonances of new item to known items (cd) and then selection or modification of one or more of those resonances to make best possible sense of new context (cn).

In Peircean terms, this is abductive. We cannot be sure what the new item is so we make the best guess possible at it. Unfortunately, educational systems tend to penalize students for doing this rather than praising them, even though it is inevitable. Students' valid attempts to make sense of things are often rejected as error.

4. Conclusion and implications

Events are differentiated in terms of various kinds of recognition: for example, by shape, light and shade, and sound (some of which, in its evocation, we refer to as language). That is, events are known through semiotic engagement and the features of events are signs. This is an empirically and logically sound basis on which to proceed, uncluttered by the mythologies of either external qualia or internal mind. It offers a non-dualist^{ix} phenomenography in the spirit of transitionalist pragmatism (Koopman, 2009) uncluttered by the joint legacies of brute empiricism and linguisticism. That is, it does not require either discrete entities with inherent qualities or a view of language as anything more or less than sounds that evoke in combination.

To construe the sign as a feature of an event is to recognize the subjective as prior to the objective. However, this is no more anti-realist than Descartes' subjective

rationalism (*cogito ergo sum*). Indeed, it is a subjective more-than-rationalism that recognizes the value of the subjective in all its aspects, from bodily functions to dreams, as the site of the real, insofar as the subjective comprises the individual's implication in events, while the intersubjective (the overlapping of phenomenal worlds) comprises collective implication in events, and therefore understanding of what events are. Physics, chemistry, biology, geography, history and theology are all examples of such intersubjective understandings, and each can therefore be taken pragmatically as the best set of explanations available to a particular society at a particular time. Epistemologically, this implies that all such sets of understanding are open to revision (usually gradual rather than revolutionary) and ethically that all are worthy of respect, for to deny the value of an explanation is to deny the worth of a person's experience, where "experience" incorporates language and the other mental activity on this non-dualist account. The future harmony of our multi-cultural world depends on this kind of realist relativism, which recognizes the subjective as both bigger than (in Kierkegaardian terms) and constitutive of the objective while simultaneously denying the givenness of brute experience and innate quality.

There are clear implications of this for education. (Education is singled out here to emphasise the becomingness of all personal and social being, whether or not it is consciously goal-directed.) As complete objective understanding is impossible but subjective experience is always valid, there is a case for shifting the emphasis in social and educational thinking from "believing in" (that is, commitment to absolute rights and wrongs) to "believing by" (that is, commitment to trying to make sense of our own and others' actions, beliefs, experiences and worldviews), and concomitantly from

judgmentalism to judgment (that is, from an emphasis on telling others what to do to an emphasis on encouraging them to decide for themselves)^x. In the teaching-and-learning situation, for example, the emphasis would then shift from teacher instruction in imparting correct understanding to replace the student's current misunderstanding, to teacher facilitation of stimulating dialogue and other activity that encourage both students and teacher to clarify current beliefs and to revise them. There would still be acknowledgment of relative expertise, but free from the debilitating myths of complete knowledge and ignorance that currently accompany the roles of teacher and student. On this revised basis, teachers may well find their students much more willing to discuss and explore than is currently the case. All this is in line with the kind of transitionalist pragmatism offered by Koopman (2009), but incorporating the semiotic commitment to the included middle, and thus a complete rejection of the strong dualism of language and experience that haunts Koopman's analysis, valuable though the latter is for undermining the latent givenness in construals of the sign by Peirce and his followers.

NOTES

¹ 'Biosemiotics encompasses all living systems from the cell, over bacteria, fungi, plants and animals to humans as sign producers and interpreters. Signs are the basic units for the study of life. Thus biosemiotics transcends the semiotic threshold between man and the rest of the world that Umberto Eco formulated. Of the two main paradigms in semiotics, Saussurian semiology and the Peircian semiotics, it is mostly Peircian semiotics that has been used to develop biosemiotics because it has a theory of signification of non-intentional signs. Biosemiotics is already prefigured in Jakob von Uexküll's *Umweltlehre*, which Thomas Sebeok fruitfully used to found biosemiotics. Philosophical biologists in Copenhagen and Tartu have influenced the further development of biosemiotics. They see living systems from cells to humans defined by interactions between a digital code in the gene or genotype and an analogue in the whole individual or

phenotype. The gene is a code for memory and self-representation the individual living body is a code for action and interaction with the real world and its ecology. Thus life appears to be a communicative interplay of different types of self- and other- descriptions carried by molecules.’ (Brier, S., undated)

² Some commentators find this exasperating: ‘Merely to say that Peirce was extremely fond of placing things into groups of three, of trichotomies, and of triadic relations, would fail miserably to do justice to the overwhelming obtrusiveness in his philosophy of the number three. Indeed, he made the most fundamental categories of all “things” of any sort whatsoever the categories of “Firstness,” “Secondness,” and “Thirdness,” and he often described “things” as being “firsts” or “seconds” or “thirds.” For example, with regard to the trichotomy “possibility,” “actuality,” and “necessity,” possibility he called a first, actuality he called a second, and necessity he called a third. Again: quality was a first, fact was a second, and habit (or rule or law) was a third. Again: entity was a first, relation was a second, and representation was a third. Again: rheme (by which Peirce meant a relation of arbitrary adicity or arity) was a first, proposition was a second, and argument was a third. The list goes on and on. Let us refer to Peirce's penchant for describing things in terms of trichotomies and triadic relations as Peirce's “triadism.”

If Peirce had a general rationale for his triadism, Peirce scholars have not yet made it abundantly clear what this rationale might be. He seemed to base his triadism on what he called “phaneroscopy,” by which word he meant the mere observation of phenomenal appearances. He regularly commented that the phenomena just *do* fall into three groups and that they just *do* display irreducibly triadic relations. (Burch, 2010: \$9)

³ ‘Throughout Peirce’s writings, we find endorsements of givenism in varying strengths implicit in his varying conceptions of Quality or firstness.’ (Koopman, 2009: 81). However, in opting for the neopragmatist approaches of Rorty, Brandom and (unusually in this company) Bourdieu, Koopman is acknowledging, to some extent at least, the enduring value of the language vs. experience divide.

⁴ Koopman, 2009: 124: ‘If the linguistic turn amounts to repudiating foundationalism by insisting on the irreducible linguisticity of all experience, , then the semiotic turn attempts to repudiate foundationalism by more modestly insisting on the irreducible meaningfulness of all experience.’

- and 126: ‘One fresh suggestion [*N.B. not ascribed by Koopman*] involves redescribing the relation between experience and language....The view here is that *language is just a kind of experience.*’ (italics in original)

⁵See Stables, 2013, for a somewhat fuller account of the weaknesses of both idealism and classical empiricism in this respect, and thus the argument for a thick or rich empiricism that resolves the dichotomy.

⁶ Substances are unique in being independent things; the items in the other categories all depend somehow on substances. That is, qualities are the qualities of substances; quantities are the amounts and sizes that substances come in; relations are the way substances stand to one another. These various non-substances all owe their existence to substances—each of them, as Aristotle puts it, exists only ‘in’ a subject. That is, each non-substance “is in something, not as a part, and cannot exist separately from what it is in” (*Cat.* 1a25). Indeed, it becomes clear that substances are the subjects that these ontologically dependent non-substances are ‘in’. (Cohen, 2012, §2)

Each member of a non-substance category thus stands in this inherence relation (as it is frequently called) to some substance or other—color is always found in bodies, knowledge in the soul. Neither whiteness nor a piece of grammatical knowledge, for example, is capable of existing on its own. Each requires for its existence that there be some substance in which it inheres.

⁷ Note that this assumption that the originary substances were physical material beings as we understand them cannot be directly inferred from Aristotle. See Bodnar, 2012, for a more extended summary of Aristotle’s thinking in this area.

⁸ cf. Nagel, 1974.

⁹ - in the sense of mind-body substance dualism.

¹⁰ Consider, for example, the strife that could be avoided if the universal emphasis in religious debate were not on defence of a committed position but rather exploration of what we, and others, mean by their religious construals and commitments.

REFERENCES

Bodnar, István. 2012. Aristotle’s Natural Philosophy, in *Stanford Encyclopedia of Philosophy*, <http://plato.stanford.edu/entries/aristotle-natphil/> 15 January 2014

Brier, Søren S. Undated) *Biosemiotics*

www.cspeirce.com/menu/library/aboutsp/brier/biosemiotics.doc, 10 January 2014

Burch, Robert. 2010. Charles Sanders Peirce, in *Stanford Encyclopedia of Philosophy*,

<http://www.seop.leeds.ac.uk/entries/peirce-semiotics/>, 22 November 2011

Cohen, S.Marc. 2012. Aristotle's Metaphysics, in *Stanford Encyclopedia of Philosophy*,

<http://plato.stanford.edu/entries/aristotle-metaphysics/>, 15 January 2014

Deely, John. 1990. *Basics of Semiotics*. Bloomington: Indiana University Press.

Derrida, Jacques. 1976. *Of Grammatology*. Baltimore: John Hopkins.

Derrida, Jacques. 1978. *Writing and Difference*. Chicago: University of Chicago Press.

Eco, Umberto. 1984. *Semiotics and the Philosophy of Language*. Bloomington: Indiana University Press.

Koopman, Colin. 2009. *Pragmatism as Transition*. New York: Columbia University Press.

Nagel, Thomas. (1974) What is it Like to be a Bat? *Philosophical Review* 4, pp.435-450

NASA (National Aeronautics and Space Administration, US) 2014. *Dark Energy and Dark Matter*. <http://science.nasa.gov/astrophysics/focus-areas/what-is-dark-energy/> 16 January 2014

Peirce, Charles Sanders. 2000. *Writings of Charles S. Peirce: a chronological edition* (ed. Houser, N. *et al*), Vol. 6. Bloomington: Indiana University Press.

Pikkarainen, Eetu. 2013. From the Ontology of Interaction to the Semiotics of Education, in Tirri, K. and Kuusisto, E. (eds.) *Interaction in Educational Domains*. Rotterdam: Sense, pp. 51-61

Saussure, Ferdinand. de 1974. *Course in General Linguistics* (Bally, C. and Sechehaye, A. eds.; Baskin, W. trans.). London: Fontana

Seibt, Johanna. 2012. Process Philosophy, in *Stanford Encyclopedia of Philosophy*
<http://plato.stanford.edu/entries/process-philosophy/> 10 January 2014

Stables, Andrew. 2006. *Living and Learning as Semiotic Engagement*. New York: Mellen.

Stables, Andrew. 2012. *Be(com)ing Human: Semiosis and the Myth of Reason*. Rotterdam: Sense.

Stables, Andrew. 2013. Semiotics as a Philosophy for Education: from concepts to signs, in Tirri, K. and Kuusisto, E. (eds.) *Interaction in Educational Domains*. Rotterdam: Sense, pp.37-49

Stables, Andrew. 2014. Peirce and Rationalism: Is Peirce a Fully Semiotic Philosopher? *Journal of Philosophy of Education* 48/4, 591-603.

Uexküll, Jakob von 1982. The Theory of Meaning. *Semiotica* 42(1), 25-82
